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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/578,871

05/11/2006

Hiroshi Sato

060347

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23850 7590 04/19/2011
KRATZ, QUINTOS & HANSON, LLP
1420 K Street, N.W.
4th Floor
WASHINGTON, DC 20005

EXAMINER

UHLIR, CHRISTOPHER J

ART UNIT

PAPER NUMBER

2832

MAIL DATE

DELIVERY MODE

04/19/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/578,871	SATO, HIROSHI	
	Examiner	Art Unit	
	CHRISTOPHER UHLIR	2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 9-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 9-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Receipt is acknowledged of applicant's amendment filed January 24, 2011.

Claims 1-6 and 9-15 are pending and an action on the merits is as follows.

Applicant's arguments with respect to claims have been considered and are addressed below.

Claim Objections

1. Claims 12 and 13 are objected to under C.F.R. 37 § 1.75 (a).

The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12 and 13 include the limitation "if the second/third key is depressed, then performing a strings resonance process". The term 'if' renders these claims indefinite. It is unclear if the process described is required even when the second/third key is not depressed in order to properly read on applicant's claims. These claims should be changed to state "wherein the second/third key is determined to be depressed, and performing a strings resonance process". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-6 and 9-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 4 include the limitation “from the data table in response to the detected difference in pitch”. However there is a lack of antecedent basis for ‘the detected difference in pitch’. It is unclear if applicant intends to introduce a new limitation where a difference in pitch is detected separately than the detected specific relation, or if the detected specific relation is related to a difference in pitch. For examining purposes, this limitation is interpreted as stating “from the data table in response to the detected specific relation”.

Claim 11 includes the limitation “from the data table in response to the detected difference in pitch”. However there is a lack of antecedent basis for ‘the detected difference in pitch’. It is unclear if applicant intends to introduce a new limitation where a difference in pitch is detected separately than the detected specific pitch relation, or if the detected specific pitch relation is determined as a difference in pitch. For examining purposes, this limitation is interpreted as stating “from the data table in response to the detected specific pitch relation”.

Claims 2, 3, 5, 6, 9, 10, and 12-15 depend on claims 1, 4, or 11 and therefore inherit all claimed limitations. These claims do not further correct the deficiencies of claims 1, 4, and 11.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 4, 9-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Assayag et al. (US 5,854,438).

Regarding claims 1 and 4, Assayag et al. discloses a resonance generation device and method of an electronic musical instrument including a keyboard (12) comprising keys including a depressed key (G) and a played key (D) (column 9 lines 30-31), where a digital signal processing unit is required in order to artificially create a resonance (sympathetic resonance) in the electronic instrument (column 2 lines 10-14). A key depression detector detects whether the depressed key (G) is already depressed at a time when the played key (D) different from the depressed key is played (column 9 lines 38-57). It should be noted that a played key is typically played when not all remaining keys are already depressed, as is recognized in the art. A specific relation detector detects a specific relation between a pitch of the played key (D) and a pitch of the already depressed key (G) (column 9 lines 56-57) in order to determine if said played key (D) is within a harmonic set of the depressed key (G) (column 8 lines 18-20).

A musical sound generator then generates a predetermined musical sound based on the specific relation between the pitch of the played key (D) and the pitch of the depressed key (G) (column 9 lines 47-51). A position of the depressed key (G) is

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further shown to generate a musical sound set in advanced based on the specific relation between the pitch of the played key (D) and the pitch of the depressed key (G) (column 9 line 63 through column 10 line 5), as can be seen from FIG._3. The musical sound generator is further disclosed to use a data table including specific relations and resonance pitches (column 8 lines 45-48), where the resonance pitches are a function of the specific relations defined by different pitches (column 7 lines 63-64). A resonance pitch from the data table representing the depressed key is added to the musical sound through extraction from the data table in response to the detected specific relation (column 8 lines 45-55), and the digital signal processing unit then generates a musical sound including the resonance pitch (column 9 lines 1-4).

In reference to claims 9 and 10, Assayag et al. discloses a resonance sound generation device and method as stated above, including a computer program product and computer-readable product for executing the resonance generation method (column 8 lines 51-55).

In reference to claim 11, Assayag et al. discloses a resonance generation method of an electronic musical instrument including a keyboard (12) comprising keys, where a digital signal processing unit is required in order to artificially create a resonance (sympathetic resonance) in the electronic instrument (column 2 lines 10-14). An occurrence of a key-on event (pressed key) is detected of a played key (D), and it is determined whether a depressed key (G) is already depressed at the time of the key-on event (column 9 lines 38-57). It should be noted that in electronic sound generation instruments, if no key other than the played key is depressed, a normal sound is

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typically generated, as is known in the art. If any key other than the played key is depressed, a string resonance process is performed including determining whether the played key (D) and the depressed key (G) are in a specific pitch relation (column 9 lines 56-57) in order to determine if said played key (D) is within a harmonic set of the depressed key (G) (column 8 lines 18-20). A predetermined musical sound is then generated based on the specific pitch relation set in advance between the played key (D) and the depressed key (G) (column 9 lines 47-51).

A position of the depressed key (G) is further shown to generate a musical sound set in advance based on the specific relation between the pitch of the played key (D) and the pitch of the depressed key (G), and a musical sound of the depressed key (G) and musical sound set in advance based on a specific relation between the pitch of the played key (D) and the pitch of the depressed key (G) is generated when the pitch of the depressed key (G) and the pitch of the played key (D) are in the specific relation (column 9 line 63 through column 10 line 5), as can be seen from FIG._3. The musical sound generator is further disclosed to use a data table including specific relations and resonance pitches (column 8 lines 45-48), where the resonance pitches are a function of the specific relations defined by different pitches (column 7 lines 63-64). A resonance pitch from the data table representing the depressed key is added to the musical sound through extraction from the data table in response to the detected specific relation (column 8 lines 45-55), and the digital signal processing unit then generates a musical sound including the resonance pitch (column 9 lines 1-4).

In reference to claims 12 and 13, Assayag et al. discloses a resonance generation method of an electronic musical instrument as stated above, where the depressed key constitutes a first depressed key, where several other keys, including a second key and a third key, are determined to be already depressed (free) at the time of the key-on event (column 4 lines 51-53). When a second key or third key is determined to be depressed, a strings resonance process is performed. Respective specific pitch relations are determined among the played key and the second or third depressed key, and other predetermined musical sounds are generated based on the respective specific pitch relation between the played key and the second or third depressed key (column 4 lines 53-54).

In reference to claim 14, Assayag et al. discloses a resonance generation method of an electronic musical instrument as stated above, where no predetermined musical sound is generated based on a specific pitch relation between the played key and an nth already-depressed key if there occurs too many depressed keys (column 4 lines 43-45). Since this reference discloses that a resonance can be successfully generated through depressing several keys (column 51-53), it is understood that n would be an integer greater than three.

In reference to claim 15, Assayag et al. discloses a resonance generation method of an electronic musical instrument as stated above, where a volume of the resonance is controlled as a function of the specific pitch relation between the played key and the depressed key (column 9 lines 55-62).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2, 3, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Assayag et al. (US 5,854,438) in view of Matsuda et al. (US 6,316,711 B2).

In reference to claims 2 and 5, Assayag et al. discloses a resonance sound generation device and method as stated above, but fails to disclose the musical sound generator to generate a monaural resonance outputted from left and right speakers with a respective volume in accordance with the position of the depressed key to make sound generation position panning.

However Matsuda et al. teaches a sound generation device and method of an electronic musical instrument (column 4 lines 43-46), where a musical sound generator generates a monaural resonance outputted from left and right speakers (column 3 lines 23-29). This reference further shows that the generated sound is outputted with a respective volume in accordance with the position of a depressed key so as to make sound generation position panning (column 4 lines 8-14).

Given the teachings of Matsuda et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the resonance generation device and method disclosed by Assayag et al. with providing the musical sound generator to generate a monaural resonance outputted from left and right

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speakers with a respective volume in accordance with the position of the depressed key to make sound generation position panning. Doing so would provide a predetermined sound image which corresponds to the depressed key, as stated in Matsuda et al. (column 4 lines 6-8).

In reference to claims 3 and 6, Assayag et al. modified by Matsuda et al. discloses a resonance sound generation device and method as stated above, where Assayag et al. further discloses the musical sound generator to control the volume of the resonance based on a relation between a position of the played key and the depressed key (column 9 lines 48-51).

Response to Arguments

Applicant's arguments filed January 24, 2011 have been fully considered but they are not persuasive.

Applicant states on page 10 that the term 'if' in claims 12 and 13 "is the correct word for a conditional statement (i.e. a logical 'if...then')". However the term 'if' does not make clear whether the claim requires the second key to be depressed. Therefore a resonance generation method meeting all limitations required by the claims where a second key is not depressed would read on applicant's claim, just as a resonance generation method where a second key is depressed and a strings resonance process is performed would read on applicant's claim.

Applicant further states that a position "set in advanced based on the specific relation between the pitch of the played key and the pitch of the depressed key is a

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position of the depressed key” is not mentioned in the rejection. However as stated in the previous and present office actions, a position of the depressed key (G) is further shown to generate a musical sound set in advanced based on the specific relation between the pitch of the played key (D) and the pitch of the depressed key (G) (column 9 line 63 through column 10 line 5). Therefore said position is a position of the depressed key (G).

On page 12, applicant states that “[i]n view of the fact that playing the D 62 key does not change the resonance, it is respectfully submitted that the claimed feature of ‘a music sound generator generating a predetermined music sound based on the specific relation between the pitch of the played key and the pitch of the depressed key’ is not disclosed by Assayag”. However Assayag et al. discloses that an excited G event occurs, and a sympathetic note is activated only after a free D event has occurred after the excited G event (column 9 lines 41-51). It is further shown that in order to produce an excited note, a key of a keyboard must be pressed at a speed higher than a predetermined speed, which “corresponds to a sufficiently powerful striking of a key of an acoustic piano to bring about a blow or percussion of the corresponding hammer on the associated string or strings” (column 2 lines 62-67). In order to produce a free note, a key of the keyboard must be pressed with a speed lower than the predetermined speed, which “corresponds to a gentle pressing of a key bringing about the withdrawal of the muffling felt, without any active blow of the hammer” (column 3 lines 4-9). Therefore the excited G event and the free D event are both produced by pressing the respective keys on the keyboard. Assayag et al. then properly discloses a music sound

generator generating a predetermined music sound based on the specific relation between the pitch of the played key and the pitch of the depressed key as required by applicant's claims.

Applicant further states on page 12 that "[t]he claimed third pitch is not disclosed, nor is selecting a third pitch from a data table, nor is that the third pitch comprises a number of semitones above the pitch of the depressed key". However applicant's claims do not include limitations pertaining to a third pitch, selecting a third pitch from a data table, or a third pitch comprising a number of semitones above the pitch of the depressed key. The claims merely refer to a third key being depressed at the time of the key-on event, and generating 'still another' predetermined musical sound based on a specific pitch relation between the played key and the third depressed key. These limitations are shown in FIG._3, where three keys are depressed (C,E,G along vertical axis) and corresponding sympathetic notes which would be generated for each depressed key.

Applicant further states on page 13 that "Matsuda describes volume panning based on the 'operated' key positions and that Matsuda does not teach any position of resonance". However both Assayag et al. and Matsuda et al. disclose a sound generation device and method of an electronic musical instrument, and more specifically, a system of processing an electronic sound signal after depressing a key in an electronic keyboard musical instrument. It has been held that "[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill

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can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *Id.* at ___, 82 USPQ2d at 1396. Since both Assayag et al. and Matsuda et al. are analogous art, they are properly combinable. Further, applying the teachings of Matsuda et al. of providing panning effects to a processed sound signal after depressing a key in an electronic keyboard musical instrument to Assayag et al. will properly disclose applicant's invention as required by the claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER UHLIR whose telephone number is (571)270-3091. The examiner can normally be reached on Monday-Friday 8:30am-4:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on 571-272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elvin G Enad/
Supervisory Patent Examiner, Art Unit 2832

/CHRISTOPHER UHLIR/
Examiner, Art Unit 2832
April 11, 2011

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